



CAIT

Center for Advanced Infrastructure & Transportation
Rutgers, The State University of New Jersey

NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Estimation of Truck Volumes and Flows		
RFP NUMBER: NJDOT 2001-18	NJDOT RESEARCH PROJECT MANAGER: Nicholas Vitillo		
TASK ORDER NUMBER: 116 / 4-26855	PRINCIPAL INVESTIGATOR: Maria Boilé		
Project Starting Date: 01/01/2002 Original Project Ending Date: 12/31/2003 Modified Completion Date: 8/31/2004	Period Covered: 1st Quarter 2004		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search	6%	-	100%	6%
1. Data Collection	8%	-	100%	8%
2. List of major truck generating facilities	8%	-	100%	8%
3. Criteria for factors that influence changes in truck flow	10%	-	100%	10%
4. Relationships between ADT and truck volumes	33%	10%	95%	31.35%
5. Methods to estimate truck flow and truck percentages	-	-	-	-
6. Validate the estimation method on a selection of 12 routes	17%	20%	55%	9.35%
7. Apply methodology on a statewide basis	8%	20%	20%	1.6%
Final Report	10%	5%	60%	6%
TOTAL	100%			80.30%

Project Objectives:

The objectives of this study are as follows:

- develop a database of truck classification counts, directly linked to existing NJDOT database systems
- develop methodologies for calculating truck volumes, flows and percentages on Interstates/Freeways, and principal arterials where some count information is available, and on lower facilities (principal and minor arterials) where little or no count information is available
- apply the methodology to New Jersey roadways to develop a GIS database of truck volumes, flows and percentages
- evaluate the methodology and the database developed using actual data collected through the NJDOT traffic monitoring system
- validate the method on a section of at least twelve highways, including four Interstate / Toll Authority routes, four principal arterials, two urban major arterials, and two rural major arterials

Project Abstract:

Freight transportation plays a vital role in the development and prosperity of a state such as New Jersey. More than 375 million tons of freight is transported each year in New Jersey. Trucks dominate this movement, accounting for 283 million tons. This project develops a procedure for estimating truck traffic on state highways, based on observed counts. A statistical approach is being developed for estimating truck volumes and flows, based primarily on classification counts and information on roadway functionality, employment, sales volume and number of establishments within the state. Models will be created that may predict the truck volumes at a certain location in the state. Profiles of truck traffic will also be developed for various roadways, indicating the ADT, truck and passenger car volumes and percentages. The procedure will be modeled within a GIS

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framework, which facilitates data analysis and presentation. Within this framework, locations in the state highway network may be selected and based on a set of criteria the data associated with the network, truck volumes, traffic profile, truck percentage etc can be estimated. The models would be used to predict truck volumes on locations where actual observations are not available. The predicted volumes along with the observed ones would be used to determine the truck traffic patterns along state highways. Sensitivity analysis will be conducted to determine how the model behavior changes with variations in the explanatory variables. Although the proposed method will be applied to a selected sample of state highways, a procedure will be developed for the statewide application of this method.

1. Progress this quarter by task:

Task 4: The models that have been developed using linear regression have been re-formulated as constrained models and have been re-estimated based on the observed data. The reason for testing these revised models being that the initial models, when used to make predictions on Truck volumes produce negative numbers in some instances. Although mathematically this has been expected, in reality it is known that truck volumes cannot have a negative value. In addition, based on the observed volumes, an upper and a lower bound may be set for the truck volumes on links adjacent to the observations.

Task 6: Both the unconstrained and the constraint models have been tested on the selected roadways and predicted volumes are compared to the observed ones. In addition, sensitivity analysis has been performed and the results have been summarized. A GIS based tool is being developed for the purpose of automating the developed approach and facilitating visual observation and analysis of the results.

Task 7: The suggested procedure for applying the methodology on a statewide basis is being developed.

Final Report: The current version of the final report is being updated to include new methods and results that are being developed.

2. Proposed activities for next quarter by task:

Task 4: Task 4 will be finalized and comparison of the two approaches, constraint and unconstrained, will be performed.

Task 6: Results of the sensitivity analysis will be summarized and the models will be validated using the observed data. Visual images of the observed data and the predictive model results will be produced in GIS.

Task 7: A near final draft of the report on how to implement the proposed approach on a statewide basis will be produced.

Final Report: the current draft of the final report will be updated

3. List of deliverables provided in this quarter by task (product date):

None

4. Progress on Implementation and Training Activities:

Training material is being developed in parallel to the development of the GIS based framework

5. Problems/Proposed Solutions:

None

Total Project Budget	\$198,566
Modified Contract Amount:	
Total Project Expenditure to date	\$147,036
% of Total Project Budget Expended	74%

* These are approximate expended amounts for the project; these estimates are for reference only and should not be used for official accounting purposes. For a more accurate project accounting please review the quarterly invoice for this project.